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AUTHOR Bump, Wren M.
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ABSTRACT

The instructor of the educational computing course at the University of Houston used action research to address the following questions and improve the course: "How could I formalize the process of action, reflection, and feedback?" and "Do certain types of learners do better with certain types of activities and certain structures for activities?" As part of the midterm, students were given two surveys and the following reflective questions: (1) "What was your most successful previous learning experience? Why?" (2) "What was your least successful previous learning experience? Why?" (3) "What do you consider to be your major blockages to learning?"; and (4) "Reflect back on one of your learning sessions in this class and describe what techniques or patterns of behavior you might be using to learn." The first survey, the Gregorc Style Delineator, indicated dominant learning styles (i.e., Abstract Sequential, Abstract Random, Concrete Sequential, Concrete Random). The Productivity Environmental Preference Survey showed environmental, emotional, sociological, and psychological learning preferences. The reflective questions were analyzed by the four learning styles categories. Use of the midterm assignment was found to be an effective way to formalize action, reflection, and feedback. Similarities were found within each of the four learning style groups in terms of types/structures of activities. (AEF)

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By:

Wren M. Bump

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Action Research in the Educational Computing Course

Wren M. Bump
Texas Southern University

The educational computing course has been part of the required courses for teacher certification for several years and has changed and evolved as a result of new practices and mandates through the years. I have taught this course at both the graduate and undergraduate levels for the past nine years and I have noticed an ever-increasing amount of competencies that are required of the education students. Not only are the students required to master the basic technologies, they are expected (in the same semester) to apply these technologies to lessons or classrooms situations. (This burden is being alleviated somewhat as other education classes begin to require technology use in the completion of assignments.) The students in these classes, when presented with the full to overflowing syllabus, express dismay, confusion, and despair, and compare their projected semester experience with trying to climb an impossibly high mountain with very little preparation and even less supplies.

Each semester I have tried to provide better and more detailed "maps" of the "mountains" with more "signs" and "guideposts" along the way. My training is in special education and I know how to break a job down into manageable and attainable pieces so the student will be successful. Also each semester I get feedback in an informal way and apply it in the next activity or the next semester's class. Each semester I find that some students have no problem "climbing the mountain and seeing the whole view from the mountaintop" (or, in other words, catch on quickly and have no problems with the activities and the course); whereas, other students have problems with each day of "climbing," or with the "path," or with their "supplies" for the "climb," or even with seeing where the "path" is leading them.

This led me to ask: "How could I formalize this process of action, reflection, and feedback?" and "Do certain types of learners do better with certain types of activities and certain structures for activities?". This paper defines action research, describes the action research done in the educational computing course for the Fall 1997 semester, and finally, discusses what was found and what action will be taken to improve the course.

What is Action Research?

Action research is a type of methodology that includes both action and research. The action refers to the change that will occur as a result of the research. The research refers to a "systematic effort to generate knowledge" (Deshler & Ewert, 1995). Dick (1997c, p.2) asserts that action research "allows you to develop knowledge or understanding as part of practice" and "allows research to be done in situations where other research methods may be difficult to use." Dick (1997c) suggests using action research if the researcher needs flexibility, or wishes to involve the participants, or desires to bring about change at the same time the research is being done. Action research "allows for systematic understanding to arise from activities which are oriented towards change. It has a capacity to respond to the demands of the informants and the situation in a way which most other paradigms cannot" (Dick, 1997c, p. 4). Reason and Heron's (1997) "collaborative inquiry" (another term for action research) is described as "a way of working with other people who have similar concerns and interests to yourself, in order to understand your world, make sense of your life and develop new and creative ways of looking at things. You also learn how to act to change things you may want to change and find out how to do things better" (p. 1).

In *A Beginner's Guide to Action Research* Dick (1997a) and his colleagues outline and discuss the major characteristics of action research:

- It is cyclic – similar steps tend to recur, in a similar sequence;
- It is participative – the clients and informants are involved as active participants in the research process;
- It is qualitative – it deals more often with language than with numbers; and
- It is reflective – critical reflection upon the process and outcomes are important parts of each cycle.

Action Research Procedures in the Educational Computing Class

Description of the Class

The educational computing class, CUIN 6320 Computers in the Classroom, at the University of Houston is a required course for teacher certification. Students must master

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several technologies and learn to integrate them into the curriculum they will be teaching. All grade levels and subject areas are represented in the fifty students enrolled in CUIN 6320. Also all levels of computer expertise from novice to expert are present in the class, so the semester begins with basic information and activities used to introduce both operating systems, Macintosh and Windows 95. Several required activities are included in the curriculum that introduce students to word processing, draw, paint, desktop publishing, email, the world wide web, web page development, presentation software, and multimedia. Students are then required to do four projects that expand their knowledge about four of the technologies. The last requirement is a teaching unit in which at least three of the technologies have been integrated.

Methodology and Instrumentation

As part of the midterm the students were given two surveys and a series of questions. Preceding this were discussions about learning styles, learning preferences, and action research. The students were told that their answers would be compiled, analyzed, and utilized to improve the course. They were encouraged to be thoughtful and truthful in their answers and that full credit would be given for the completed assignment. The two surveys that were given were the Gregorc Style Delineator (Gregorc, 1985) and the *Productivity Environmental Preference Survey* (Dunn, Dunn, & Price, 1996). The Style Delineator is based on four quadrants that represent how a person perceives the world (abstract or concrete) and orders that information (sequential or random). A person's learning style will be dominant in one of the four quadrants with the results being Abstract Sequential(AS), Abstract Random(AR), Concrete Sequential(CS), or Concrete Random(CR). Research shows that there is significantly greater chance that graduate students will be Abstract Sequential (Cromwell, 1996) and that they like to dig into assignments, work alone, and organize work in large chunks to see the total picture (Andrews & Wheeler, 1994). Andrews and Wheeler (1994) also found that Concrete Sequentials tended to prefer traditional methods of instruction with deadlines and preselected assignments; that Abstract Randoms liked working in groups, creative scheduling, and less specific assignments; and that Concrete Randoms preferred to choose their products, methods, and due dates in a flexible framework.

The learning preferences survey shows preferences such as environmental (noise, light, temperature), emotional (motivation, persistence, responsibility), sociological (individual or team), and psychological (perception, intake, time) (O'Connor, 1997). Using a preference survey is a "useful first step toward analyzing the conditions under which an adult is most likely to produce, achieve, create, solve problems, make decisions, or learn" (Price, 1996).

The third part of the midterm consisted of several questions that the students were to thoughtfully answer. For the sake of space the questions will be listed in the results section.

After the midterm was collected and analyzed, the information gained was used to adapt and modify the upcoming assignments and class time. The students then had more time for reflection and feedback as we progressed through the class.

Results and Findings

Out of the 50 students that were surveyed, 38% were Abstract Sequential, 28% were Abstract Random, 20% were Concrete Sequential, and 14% were Concrete Random. Table 1 shows the percentage of each of the four learning styles and their preferences on a sampling of the questions from the Productivity Environmental Preference Survey.

Reflective Questions. The following questions were analyzed by the four learning styles groups.

- What was your most successful previous learning experience? (not in this class) Why? The AS group described experiences in which new techniques and creative methods were introduced and used; active learning at their own pace was allowed; teachers treated students as individuals and were accessible to students; and there was much group work. The CR group described experiences that were structured informally and had lots of choices and hands-on activities that related to the real world and to their experiences. The CS group described experiences that included challenging classes, in-depth reading, concrete demonstrations, thought-provoking discussions, and direct and immediate application of the lecture concepts. The AR group described experiences in which they were totally immersed in a Spanish-speaking environment; experiences where they had to learn everything by themselves; experiences in which they observed and learned from others; and experiences that utilized higher-order thinking and had lots of structure and strict deadlines.
- What was your least successful previous learning experience? (not in this class) Why? The AS group described experiences in which there was no interaction; there were lots of facts to be memorized; there were vague directions; and individual ideas were rejected. The CR group described experiences that were boring, vague, and consisted of lectures and notetaking. The CS group described experiences that included teachers with negative attitudes, extensive reading, holistic learning, no guidance or assistance, and no opportunity to manipulate the concepts to get the required results. The AR group described experiences in which they learned something that they could not apply or practice; they also described boring lectures and large classes.

Table 1.
Results of the preference survey.

	CS	CR	AS	AR
1. I prefer working in bright light.	100%	71%	84%	71%
I prefer to work where lights are shaded.	0%	29%	16%	29%
2. I can block out noise when I work.	30%	43%	58%	79%
Noise keeps me from concentrating.	70%	57%	42%	21%
3. I prefer cool temperatures when I work.	50%	14%	53%	64%
I often wear a sweater or a jacket indoors.	50%	86%	47%	36%
4. I can think better lying down.	20%	43%	11%	0%
I can concentrate better when I sit up.	80%	57%	89%	100%
5. I feel I am self-motivated.	80%	86%	89%	79%
I work better when someone is going to check up on me.	20%	14%	11%	21%
6. People remind me to complete my work.	0%	14%	5%	7%
I usually complete tasks that I start.	100%	86%	95%	93%
7. I prefer the teacher set deadlines.	60%	71%	26%	79%
I like to work at my own pace.	40%	29%	74%	21%
8. I like to work alone.	90%	100%	79%	64%
I like to work with several colleagues.	10%	0%	21%	36%
9. I remember what I hear.	20%	0%	11%	21%
I remember what I see.	80%	100%	89%	79%
10. I learn better with written directions.	90%	100%	95%	93%
I learn better when someone reads the directions to me.	10%	0%	5%	7%
11. I like to work with my hands.	60%	43%	42%	86%
I like to think about problems to solve.	40%	57%	58%	14%
12. I like to snack when I'm working.	70%	86%	63%	57%
Eating while working would distract me.	30%	14%	37%	43%
13. It is easy for me to concentrate late at night.	40%	71%	63%	50%
I work best early in the morning.	60%	29%	37%	50%

- What do you consider to be your major blockages to learning? The AS group said distractions, time, anxiety, lecture classes with no opportunity to practice, comprehension of written material, lack of desire, inadequate background, getting started, disorganization, boredom, and procrastination. The CR group said lack of interest, no hands-on training, low concentration, and not being able to relate the material. The CS group said low self-confidence, vocabulary, small attention span, difficult time understanding directions, procrastination, perfectionism, not writing something down, attitude, irrelevance, and no purpose for the assignment. The AR group said time, stress, things that interest me, a large amount of reading, boredom, irrelevant or boring material, too much information presented at one time, and fear.
- Reflective thinking means watching yourself as you learn something and observing what you do, how you do it, and how you feel about it as you do it. Reflect back on one of your learning sessions in this class and describe what techniques or patterns of behavior you might be using to learn. Were you guessing? Were you asking for help? If you did not ask for help, why not? Were you using trial and error? Were you embarrassed? Lost? Frustrated? Excited? Satisfied? Did you gain energy or were you worn out? Did you keep bashing your head against the wall? Were you flexible or rigid? Did you learn better with others or by yourself? (This last question was from Algonquin College of Applied Arts and Technology, 1996)

The AS group did not mind asking for help from others and liked working in groups although they were hesitant at first; they used trial and error much of the time; they were worn out by the end of the class time. The CR group was flexible in their learning and would guess much of the time; they found it hard and tedious to follow the step-by-step instructions of the activities; they like to figure things out in their own creative way; they were energized by the learning and the class work. The CS group concentrated on the steps and "getting it right"; they were anxious and rigid as they completed their activities; they wanted more organization and direction on the student-choice projects; they did not mind asking question after question because it kept them from becoming completely frustrated; they also wanted as much material and information as they could get before attempting any of the activities. The AR group liked to practice things on their own and try to figure things out for themselves and explore their other options; they were flexible and even changed ideas and strategies in the middle of a lesson; they were motivated to do more and felt energized by the work; and they were frustrated by others always asking them questions.

Conclusion

In answering the first question, "How could I formalize this process of action, reflection, and feedback?", the use of the midterm as this assignment provided the answer. The students were motivated to give thoughtful answers in order to receive full credit and they were able to analyze their own

feelings more accurately and use them in a more positive way. They found that they were not alone in their experiences and feelings and that the experiences were a normal and acceptable part of the learning process.

In future classes the reflection will be a weekly activity so that it is not an overwhelming exercise and the students can profit from these reflections. Also the teacher will spend more time with small groups each class period so that students feel like they are getting as much help and encouragement as they need.

In answering the second question, "Do certain types of learners do better with certain types of activities and certain structures for activities?", there were similarities found within each of the four learning style groups. The students were anxious to see the results of the two surveys and to get feedback on what the results meant. They liked doing the self-study and finding out more about themselves as learners. This information helped them as they approached the new experiences in subsequent classes. These surveys also helped them to see that they were not alone and that some experiences would be more positive than others would, and that it was all right to have particular preferences.

In future classes these surveys will be done immediately so that the students can use them as a learning experience and a foundation for the whole class. This experience will make them better, more thoughtful practitioners in their professional lives and will allow them to see things through the eye of the learner. It should also help them evaluate their experiences more thoroughly and grow as lifelong learners.

References

Algonquin College of Applied Arts and Technology (1996). *Reflective thinking* [On line]. Available at http://www.algonquinc.on.ca/edtech/gened/reflecti.html

Andrews, S. & Wheeler, P. (1994). *Personalizing instructional supervision: Differentiating support structures for teachers*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA, April 4-10, 1994. (ERIC Document Reproduction Service No. ED375081)

Cromwell, R.R. (1996). *Who are we as instructional leaders: A statistical analysis*. Paper presented at the Annual Meeting of American Association of Colleges for Teacher Education, Chicago, IL, February 21-24, 1996. (ERIC Document Reproduction Service No. ED393830)

Deshler, D., & Ewert, M. (1995). *Participatory action research: Traditions and major assumptions* [On line]. Available at http://www.parnet.org/tools/Tools_1.cfm

Dick, B. (1997a). *A beginner's guide to action research* [On line]. Available at http://www.scu.edu.au/schools/sawd/arr/guide.html

Dick, B. (1997b). *Action learning and action research* [On line]. Available at http://www.scu.edu.au/schools/sawd/arr/actlearn.html

Dick, B. (1997c). *Action research FAQ: "Frequently asked questions" file* [On line]. Available at http://www.scu.edu.au/schools/sawd/arr/choice.html

Gregorc, A. (1985). *Gregorc style delineator: A self-assessment*. Columbia, CT: Gregorc Associates.

O'Connor, T. (1997). *Using learning styles to adapt technology for higher education* [On line]. Available at http://web.indstate.edu/ctl/styles/learning.html

Price, G. (1996). *Productivity environmental preference survey manual*. Lawrence, KS: Price Systems, Inc.

Reason, P. & Heron, J. (1997). *A layperson's guide to cooperative enquiry* [On line]. Available at http://www.bath.ac.uk/carpp/LAYGUIDE.htm

Whitefield, D. (1995). Learning styles – great minds don't think alike! In Summers, L. (Ed.), A Focus on Learning, p. 271-275. Proceedings of the 4th Annual Teaching Learning Forum, Edith Cowan University, February, 1995. Perth: Edith Cowan University. Available at http://cleo.murdoch.edu.au/asu/pubs/tlf/tlf95/whit271.html

Wren M. Bump is an assistant professor in the Curriculum and Instruction department at Texas Southern University. Work phone: (713) 313-1832 Fax: (713) 313-7504 E-mail: wren@tenet.edu